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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,778	02/09/2004	Gregor Dudziak	Bayer 10269-WCG	8841
27386 7590 08/21/2008 NORRIS, MCLAUGHLIN & MARCUS, P.A. 875 THIRD AVE 18TH FLOOR NEW YORK, NY 10022				
EXAMINER MENON, KRISHNAN S				
ART UNIT		PAPER NUMBER		
1797				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/774,778

Applicant(s)

DUDZIAK ET AL.

Examiner

Krishnan S. Menon

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-8 and 10-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8 and 10-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB06)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claims 1,2,4-8 and 10-17 are pending as amended 8/8/08 in the RCE.

Claim Rejections - 35 USC § 102/103

1. Claims 1,2,4-8,10,11 and 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by, or in the alternative, under 35 USC 103(a) as being obvious over, Karau, et al (US 6,472,571).

Karau teaches a process for separation from a non-aqueous homogeneous or colloidal solution of a catalyst (abstract, column 2, lines 38-44), with a ceramic membrane having a hydrophobic coating of alkoxysilanes as claimed (see the silanes in column 3, lines 45-67).

Membrane porosity is less than 10 nm preferred (column 4, lines 1-10).

Ceramic is alumina, etc (column 4, lines 9-17)

Non-aqueous solvents taught; specific examples are THF and methanol. (tables 1 and 2, examples)

Temperature is in the range claimed – column 2, 3-10; more over, the range includes ambient, and unless the reference specifies a temperature, ambient temperature would be implied. Pressure required for the membrane process also would be implied in the reference, unless applicant can show criticality of the range.

Applicant's arguments traversing this rejection are not persuasive.

Interpretation of claim 1: Claim 1 recites in part relevant to applicant's arguments traversing this rejection:

Claim 1 (**currently amended**) Process for the separation from a non-aqueous solvent of a **solid** substance which is present in said non-aqueous solvent in dissolved form, colloidal form, or in both of such forms. **without changing the molecular weight of said solid substance,** which comprises passing said non-aqueous solvent through a membrane having.

The emphasized part of the claim requires that the substance in dissolved or colloidal form is solid; and its molecular weight should not change during the claimed process, that is, its molecular weight should not change while being separated from the non-aqueous solvent using the membrane.

The reference teaches use of a ceramic membrane, as claimed, in recovering dissolved or colloiddally soluble catalyst (column 2, lines 29–64). The reference does not teach synthesizing the catalyst, but only teaches using the catalyst for synthesizing organic compounds. The term 'increased molecular weight' in this reference appears to mean only having a *higher molecular weight*. The office does not believe that the catalyst is somehow growing in molecular weight in the process described in this reference. This is evident from the paragraph at column 4, lines 32-41. This paragraph teaches about catalyst "Catalyst having increase molecular weight made from dendritic, linear or variously branched homopolymer ...", etc., which only explains the source for the catalyst. Column 5, lines 17-25 teaches the definition of the "increased molecular weight" as:

"In the context of the invention the term increased molecular weight refers to the increase in molecular weight of the catalyst under consideration by means of adsorptive or covalent bonding to appropriate organic or inorganic homogeneously or colloiddally soluble support materials, e.g. nanoparticles (Zhao et al. Angew. Chem. 1999, 111, No.3)."

Example 2 in the reference teaches the process as claimed, wherein a catalyst of molecular weight 38kD dissolved in THF is used to reduce tetralone to tetralol, which is circulated through a ceramic membrane. The claims of the reference also anticipate the instant claims.

Moreover, even if the reference had taught the catalyst molecules as 'growing' in molecular weight, it still would still be obvious to one of ordinary skill in the art at the time of invention to have this same process for separating the catalyst from the solvents as taught by this reference to contain the catalyst in the reacting vessel as taught by the reference. See column 1, lines 20-40.

Argument that the reference teaches only two layers is not persuasive: the reference has a ceramic support layer, an inter layer and a silane layer.

Argument that the Karau reference teaches catalyst of increased molecular weight (or larger molecular weight) is not commensurate in scope with the claim or the rejection. The claims are not limited by the molecular size of the catalyst. However, adding such a limitation to the claims also would not make the claims patentable – it would be inherent in the teaching of the reference, because the membrane of the reference would separate any dissolved substance whose molecular weight above the cut-off molecular weight of the membrane. The molecular weight of the Karau reference does not increase in molecular weight during the process.

2. Claims 12-14 are rejected under 35 USC 103(a) as being unpatentable over Karau as applied to claim 2 above, and further in view of WO 01/07157.

Claims differ from the reference in the teaching of the specific type of catalyst, i.e., organometallic catalyst from certain groups of the periodic table. However, the Karau reference teaches that the process of separating catalyst from reacting mixtures to retain them in the reactor is well known in the art, and the focus of the Karau invention is on the inorganic membrane for this purpose, as well stated in the column 1 of the reference. . WO teaches a process for separating solutes or colloids such as catalysts (page 7, 8: rhodium-organophosphite complex) from a non-aqueous solution. Membrane is ceramic (alumina, zirconia: page 10), with coating (the sub-nanoporous coating of metal or ceramic or inorganic polymeric material is a coating (page 7) (but WO does not teach the specific silane claimed). It would be obvious to one of ordinary skill in the art at the time of invention to ***combine these references to extend the use of Karau for the catalysts as taught by WO***. One would use the Karau membrane for such applications as taught by WO because of the advantages of Karau membrane, such as extremely high retention ability of the catalyst, as taught in column 2, lines 51-64.

In response to the argument traversing this rejection:

As argued above, employment of the membrane disclosed by Karau in the process of WO would yield loss of enablement of separating the catalyst from the liquid without having to increase the molecular weight of the catalyst. Therefore the combination of the teachings of Karau with WO can not overcome the discrepancies between Karau and Applicant's invention.

This argument is not persuasive. WO teaches pore size 15A or less for separating catalyst particles of size 30A or less – see page 9 of WO. The silane coating of Karau would provide the improvements as taught by Karau. Therefore, one would

modify Karau with the teaching of WO for the particle size, or WO membrane with the teaching of the silane coating of Karau for having an improved membrane for separating the particle size as in WO with the efficiency of Karau.

Response to Arguments

Applicant's arguments filed with the RCE of 8/8/08 have been fully considered but they are not persuasive. They are addressed below:

Rejection over Karau:

(1) Argument:

Thus, Karau does not teach that a non-aqueous solution does prevail or that a separation takes place, as is claimed by applicant.

Not persuasive; the reference clearly teaches the solvents as well as the intent that it is meant for non-aqueous solvents. See column 5, lines 2-12 for membrane separation, and tables and working examples for solvents. See also column 1, starting at line:

"Until now exclusively polymeric membranes of organic origin have been used in processes in which homogeneously or colloiddally soluble catalysts having increased molecular weight were used in membrane reactors.

The use of polymeric membranes is associated with a number of disadvantages, however, because of the organic solvents used in chemical synthesis.

The solvent resistance of the polymeric membranes that are commercially available at present applies in each case only to selected solvents. Different membranes therefore have to be used in production, depending on the reaction and solvent. In practice this means that the membranes have to be changed between different production batches. Moreover, when changing between polar and non-polar solvents, various membrane conditioning steps have to be

interposed (Schmidt et al.; Chemie Ingenieur Technik (71), 3/1999)."

Karau also teaches retentions of >90% for the catalyst by the membrane at various places in the reference, which is separation of the catalyst from the solution.

(2) Argument:

As stated above, Karau refers to the use of catalysts "with increased molecular weight", which is defined in Column 5, lines 17-25, stating that the catalyst is increased "in molecular weight by means of adsorptive or covalent bonding to organic or inorganic homogeneously or colloiddally soluble support materials, e.g. nanoparticles". Thus, it is clear that Karau's membrane and the membrane as claimed by Applicant are entirely different. Otherwise, it would not be clear as to why Karau would require "increased molecular weights"? This is a redundant step (no matter at which time, whether before or within the separation) and one can therefore likewise argue that the membrane of Applicant has to have different properties as, in contrast to the teaching of the Karau reference, separation of not enlarged substances is ensured.

As pointed out in the prior office actions, any increase in the molecular weight of the catalyst is outside the membrane process in the reference, and has no relevance to what is being claimed. Moreover, the Examiner submits that the "increased molecular weight catalyst" as is used in the reference only means a catalyst of higher molecular weight brought about by adsorptive or covalently bonding to ... nanoparticles. The catalyst is already prepared that way before being used in the Karau process. Argument that "separation of not enlarged substance is assured" is not relevant to, and not commensurate in scope with, the claims.

(3) Regarding applicant's membrane being asymmetric, Karau teaches asymmetric membranes, even if it does not spell out the word asymmetric. The Karau

Art Unit: 1797

membrane has non-uniform pore size across its thickness - the characteristic of an asymmetric membrane. Applicant has not shown any evidence that indicate the Karau membrane as *not asymmetric*.

Rest of the arguments about the Karau reference are not commensurate in scope with the claims – claims are not so limited as argued.

Arguments traversing the combination of references Karau and WO:

Arguments are not persuasive because applicant has not provided any evidence or substantive reasoning as to why the claims are not obvious over the combination of references, Other than simply stating the structure of membrane taught by the references, and stating that it is not obvious.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1797

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Krishnan S Menon/
Primary Examiner, Art Unit 1797